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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/523,267	01/31/2005	Tohru Ishizuya	4641-70412-01	1135

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EXAMINER

CHIU, TSZ K

ART UNIT PAPER NUMBER

2822

DATE MAILED: 06/30/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/523,267

Applicant(s)

ISHIZUYA, TOHRU

Examiner

Tsz K. Chiu

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 11 April 2006.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-7 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-7 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date 5-26-06.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

DETAILED ACTION

Response to Arguments

Applicant's arguments with respect to claim 1-7 have been considered but are moot in view of the new ground(s) of rejection.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claim 1-4 are rejected under 35 U.S.C. 102(b) as being anticipated by Park et al. (6,136,390).

With respect to claim 1, Park discloses a substrate (312, For example Fig. 2L); and three-dimensional structures (right 301, For example Fig. 2L) arranged in a predetermined effective area on the substrate, wherein the three-dimensional structures (right 301, For example Fig. 2L) have space portions (between 430 and 310, For example Fig. 2L), which are formed by removing a sacrificial layer, between the three-dimensional structures (right 301, For example Fig. 2L) and the substrate (312, For example Fig. 2L), and on the substrate, a dummy area is arranged to surround the effective area, dummy structures (left 301, For example Fig. 2L) are arranged in the dummy area (forming an array of a pair of cavities device dummy area is surrounding 3-d structure), and the dummy structures (left 301, For example Fig. 2L) have space

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portions (between left 430 and left 310, For example Fig. 2L), which are formed by removing a sacrificial layer, between the dummy structures (left 301, For example Fig. 2L) and the substrate (312, For example Fig. 2L).

With respect to claim 2, Park discloses a portion of the dummy structures (left 301, For example Fig. 2L) opposed to the substrate (312, For example Fig. 2L) is formed in a same shape as the three-dimensional structures (right 301, For example Fig. 2L).

With respect to claim 3, Park discloses the dummy structures (left 301, For example Fig. 2L) have columns for fixing at least one section thereof to the substrate (312, for example fig. 2L).

With respect to claim 4, Park discloses the dummy structures (left 301, For example Fig. 2L) have a thin film (left 395, for example fig. 2L) covering the dummy area and plural columns arranged between the thin film (left 395, for example fig. 2L) and the substrate (312, for example fig. 2L).

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claim 7 is rejected under 35 U.S.C. 103(a) as being unpatentable over Park et al. (6,136,390) in view of Yagi (5,994,750).

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With respect to claim 7, Park discloses a step of forming a sacrificial layer (340, for example fig. 2K) and predetermined thin film (185, for example fig. 2K) three-dimensional structures (right 301, for example fig. 2K) in a predetermined effective area on a substrate (312, for example fig. 2K) and forming a sacrificial layer (340, for example fig. 2K) and predetermined thin film (185, for example fig. 2K) dummy structures (left 301, for example fig. 2K) in a dummy area surrounding the effective area; and a step of removing the sacrificial layers (340, for example fig. 2K) in the effective area and the dummy area with a wet process (column 4, lines 30-33) However, Park did not disclose the sacrificial layers are removed by dry etch process.

Yagi discloses the sacrificial layer can be removed by dry etching using the technology of reactive ion etching (RIE) and any possible sticking phenomenon that may appear between the microstructure and the substrate.

Since Park and Yagi are both from the same field of endeavor oscillation prevention, the purpose disclosed by Yagi would have been recognized in the pertinent art of Park.

Therefore, it would have been obvious at the time the invention was made to a person having ordinary skill in the art to have used Yagi dry etching process for the purpose of dry etching having a better resolution in thin film structures.

Claim 5-6 are rejected under 35 U.S.C. 103(a) as being unpatentable over Park et al. (6,136,390) in view of Wu et al. (6,526,198).

With respect to claim 5, Park discloses optical waveguide substrate (312, For example Fig. 2L); and three-dimensional structures (right 301, For example Fig.

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2L) arranged in a predetermined effective area on the substrate, wherein the three-dimensional structure (right 301, For example Fig. 2L) element substrate (right side 312, For example Fig. 2L) has a substrate and three-dimensional structures (right 301, For example Fig. 2L) arranged in a predetermined effective area on the substrate, on the substrate, a dummy area is arranged to surround the effective area, dummy structures (left 301, For example Fig. 2L) are arranged in the dummy area (forming an array of a pair of cavities device dummy area is surrounding 3-d structure), and the dummy structures (left 301, For example Fig. 2L) have space portions (between left 430 and left 310, For example Fig. 2L), which are formed by removing a sacrificial layer, between the dummy structures (left 301, For example Fig. 2L) and the substrate (312, For example Fig. 2L). However, Park did not disclose the three-dimensional structures include the reflecting mirrors and displacement portions on which the reflecting mirrors are placed, and the displacement portions have space portions, between the displacement portions and the substrate.

Wu discloses the three-dimensional structures (figure 3a) include the reflecting mirrors (12, For example Fig. 3a) and displacement portions (11a, For example Fig. 3a) on which the reflecting mirrors (12, For example Fig. 3a) are placed, and the displacement portions have space portions (between 11a and 44, For example Fig. 3a), between the displacement portions and the substrate.

Since Park and Wu are both from the same field of endeavor MEMS mirror device, the purpose disclosed by Wu would have been recognized in the pertinent art of Park.

Therefore, it would have been obvious at the time the invention was made to a person having ordinary skill in the art to have use Wu vertical mirror in Park

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invention for the purpose of improve, precise optical alignments in free space, and through micromechanical opt mechanical switches.

With respect to claim 6, Park discloses three-dimensional structures (right 301, For example Fig. 2L) the micro device has a substrate (312, For example Fig. 2L) and the thin film three-dimensional structures (right 301, For example Fig. 2L) arranged in a predetermined effective area on the substrate (right 312, For example Fig. 2L), the thin film three-dimensional structures (right 301, For example Fig. 2L) have space portions (between 430 and 310, For example Fig. 2L), which are formed by removing a sacrificial layer, between the three-dimensional structures (right 301, For example Fig. 2L) and the substrate (312, For example Fig. 2L), and on the substrate, a dummy area is arranged to surround the effective area, dummy structures (left 301, For example Fig. 2L) are arranged in the dummy area (forming an array of a pair of cavities device dummy area is surrounding 3-d structure), and the dummy structures (left 301, For example Fig. 2L) have space portions (between left 430 and left 310, For example Fig. 2L), which are formed by removing a sacrificial layer, between the dummy structures (left 301, For example Fig. 2L) and the substrate (312, For example Fig. 2L).

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Tsz K. Chiu whose telephone number is 517-272-8656. The examiner can normally be reached on 0800 to 1700.

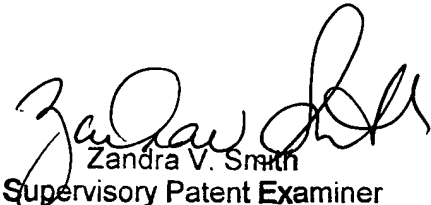
If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Zandra V. Smith can be reached on 571-272-2429. The

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fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

TC
June 26, 2006


Zandra V. Smith
Supervisory Patent Examiner
26 June 2006